



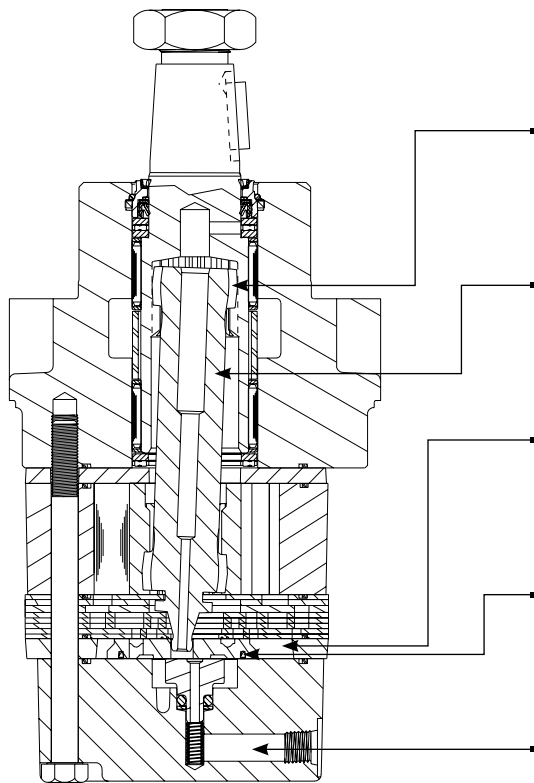
HB

SERIES HYDRAULIC MOTORS

HB

OVERVIEW

The HB Series motor is the leader in its class, offering high efficiency and durability. The three-zone orbiting valve, laminated manifold and Roller Stator® motor work harmoniously to produce high overall efficiencies over a wide range of operating conditions. The standard case drain increases shaft seal life by reducing internal pressures experienced by the seal. Case oil leakage is also directed across all driveline components, increasing motor life. An internal drain option is also available. At the heart of the motor is a heavy-duty driveline, offering 30% more torque capacity than competitive designs. These features make the HB Series motor the preferred choice for applications requiring peak efficiency for continuous operation.



KEY FEATURES

- Forced Drive Link Lubrication** reduces wear and promotes longer life from motor.
- Heavy-Duty Drive Link** is up to 30% stronger than competitive designs for longer life.
- Three-Zone Orbiting Valve** precisely meters oil to produce exceptional volumetric efficiency.
- Rubber Energized Steel Face Seal** does not extrude or melt under high pressure or high temperature.
- Standard Case Drain** increases shaft seal life by reducing pressure on seal.

SPECIFICATIONS

Intermittent Ratings - 10% of Operation Peak Ratings - 1% of Operation

CODE	Displacement cc [in ³ /rev]	Max. Speed rpm		Max. Flow lpm [gpm]		Max. Torque Nm [lb-in]		Max. Pressure bar [psi]		
		cont.	inter.	cont.	inter.	cont.	inter.	cont.	inter.	peak
050	52 [3.2]	680	830	38 [10]	45 [12]	135 [1200]	158 [1400]	207 [3000]	242 [3500]	276 [4000]
080	76 [4.6]	800	950	53 [14]	64 [17]	191 [1700]	222 [1975]	207 [3000]	242 [3500]	276 [4000]
090	89 [5.4]	680	840	61 [16]	76 [20]	225 [2000]	270 [2400]	207 [3000]	242 [3500]	276 [4000]
110	111 [6.8]	680	850	76 [20]	95 [25]	298 [2650]	349 [3100]	207 [3000]	242 [3500]	276 [4000]
125	127 [7.7]	580	740	76 [20]	95 [25]	338 [3000]	394 [3500]	207 [3000]	242 [3500]	276 [4000]
160	164 [10.0]	460	580	76 [20]	95 [25]	448 [3975]	512 [4550]	207 [3000]	242 [3500]	276 [4000]
200	205 [12.5]	370	460	76 [20]	95 [25]	569 [5050]	653 [5800]	207 [3000]	242 [3500]	276 [4000]
250	254 [15.5]	290	370	76 [20]	95 [25]	704 [6250]	799 [7100]	207 [3000]	242 [3500]	276 [4000]
300	293 [17.9]	250	320	76 [20]	95 [25]	811 [7200]	929 [8250]	207 [3000]	242 [3500]	276 [4000]
400	409 [24.9]	180	230	76 [20]	95 [25]	946 [8400]	1019 [9050]	173 [2500]	189 [2750]	207 [3000]



050

Pressure - bars [psi]							Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]	

52 cc [3.2 in³/rev.]

Max. Max. Inter. Cont.	Flow - lpm [gpm]	2 [0.5]	4 [1]	8 [2]	15 [4]	23 [6]	30 [8]	38 [10]	45 [12]
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Intermittent Ratings - 10% of Operation

Torque - Nm [lb-in], Speed rpm								
7 [66]	18 [158]	38 [314]	51 [447]	66 [587]				
36	31	26	21	9				
9 [77]	19 [164]	38 [335]	57 [505]	71 [631]	87 [772]	98 [866]		
72	69	65	63	33	32	9		
9 [75]	19 [164]	39 [342]	59 [521]	78 [690]	95 [840]	109 [964]	123 [1086]	
142	140	135	133	122	102	77	57	
8 [68]	19 [164]	38 [340]	57 [507]	78 [688]	99 [872]	112 [993]	129 [1145]	
288	286	285	284	265	245	211	189	
		36 [319]	56 [492]	76 [669]	97 [859]	114 [1009]	134 [1182]	
		431	427	416	396	347	321	
		34 [304]	53 [467]	73 [646]	95 [841]	113 [1001]	134 [1183]	
		577	572	568	543	488	463	
			51 [451]	71 [628]	92 [810]	111 [978]	133 [1174]	
			699	683	665	634	604	
			48 [427]	68 [606]	88 [781]	111 [980]		
			847	825	798			

37	Theoretical rpm
73	
145	
289	
434	
578	
722	
867	

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

14 [127]	29 [255]	58 [510]	86 [764]	115 [1019]	144 [1274]	173 [1529]	202 [1783]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

080

Pressure - bars [psi]							Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]	

76 cc [4.6 in³/rev.]

Max. Max. Inter. Cont.	Flow - lpm [gpm]	2 [0.5]	4 [1]	8 [2]	15 [4]	23 [6]	30 [8]	38 [10]	45 [12]	53 [14]	61 [16]	64 [17]
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Intermittent Ratings - 10% of Operation

Torque - Nm [lb-in], Speed rpm									
14 [127]	30 [262]	61 [543]	91 [806]	120 [1062]	145 [1285]	169 [1496]	191 [1693]		
25	24	21	18	17	11	11	9		
16 [140]	32 [286]	63 [559]	95 [839]	124 [1099]	151 [1340]	178 [1579]	203 [1796]		
50	50	43	43	34	32	32	31		
16 [139]	32 [280]	64 [563]	97 [857]	129 [1139]	157 [1390]	187 [1652]	211 [1865]		
100	100	99	92	87	79	78	77		
14 [127]	31 [275]	65 [572]	99 [872]	131 [1155]	160 [1420]	186 [1643]	216 [1911]		
200	200	199	191	181	174	160	154		
13 [113]	30 [262]	63 [557]	96 [853]	130 [1149]	160 [1420]	186 [1646]	218 [1930]		
301	300	297	295	284	271	253	245		
10 [91]	27 [243]	61 [536]	93 [826]	127 [1125]	159 [1409]	187 [1654]	220 [1945]		
401	400	398	390	384	372	346	339		
	24 [212]	58 [511]	89 [790]	123 [1087]	156 [1379]	185 [1638]	213 [1883]		
	502	500	499	498	485	443	433		
	20 [177]	54 [482]	87 [767]	120 [1060]	164 [1451]	193 [1711]	228 [2021]		
	602	601	600	597	540	526	510		
	14 [127]	50 [445]	84 [741]	124 [1098]	155 [1369]	185 [1640]	217 [1918]		
	690	689	688	658	644	631	613		

26	Theoretical rpm
51	
101	
201	
302	
402	
503	
603	
704	
804	
904	

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

21 [183]	41 [366]	83 [732]	124 [1099]	166 [1465]	207 [1831]	248 [2197]	290 [2564]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



090

Pressure - bars [psi]						Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]

89 cc [5.4 in³/rev.]

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm								Theoretical rpm
	12 [106]	26 [231]	69 [609]	100 [889]	142 [1259]	174 [1537]	206 [1826]	232 [2049]	
2 [0.5]	21	19	17	15	13	10	7	5	22
4 [1]		30 [264]	68 [605]	107 [947]	146 [1296]	180 [1596]	212 [1875]	242 [2142]	43
8 [2]		33 [291]	71 [629]	108 [958]	149 [1323]	183 [1620]	221 [1956]	251 [2223]	86
15 [4]			72 [636]	113 [1003]	153 [1351]	188 [1664]	225 [1990]	260 [2300]	172
23 [6]			72 [633]	112 [995]	151 [1340]	187 [1654]	226 [1996]	260 [2304]	257
30 [8]			68 [598]	109 [960]	151 [1340]	188 [1660]	227 [2012]	263 [2326]	343
38 [10]				108 [959]	150 [1328]	188 [1667]	229 [2024]	270 [2393]	428
45 [12]				109 [961]	153 [1356]	195 [1728]	232 [2049]	271 [2398]	514
53 [14]				145 [1287]	190 [1678]	213 [1886]	241 [2135]	282 [2495]	599
61 [16]				134 [1190]	187 [1654]	192 [1701]	227 [2007]	269 [2384]	685
68 [18]					136 [1201]	189 [1675]	240 [2122]		770
76 [20]					136 [1205]	174 [1536]	216 [1916]		856

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

24 [215]	49 [430]	97 [860]	146 [1290]	194 [1720]	243 [2150]	291 [2580]	340 [3010]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

110

Pressure - bars [psi]						Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]

111 cc [6.8 in³/rev.]

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm								Theoretical rpm
	12 [106]	39 [347]	88 [777]	135 [1199]	182 [1609]	223 [1977]	273 [2420]	304 [2690]	
2 [0.5]	16	16	14	11	9	8	6	5	17
4 [1]	16 [142]	42 [374]	97 [857]	146 [1290]	199 [1763]	246 [2179]	293 [2592]	329 [2916]	34
8 [2]		42 [372]	98 [866]	148 [1313]	201 [1782]	249 [2204]	297 [2629]	345 [3050]	68
15 [4]			94 [835]	149 [1320]	201 [1777]	251 [2223]	302 [2674]	348 [3083]	136
23 [6]			93 [819]	148 [1312]	201 [1775]	250 [2215]	302 [2671]	348 [3078]	204
30 [8]			89 [785]	145 [1287]	199 [1760]	249 [2204]	299 [2648]	352 [3114]	272
38 [10]			83 [738]	139 [1232]	194 [1718]	244 [2163]	296 [2617]	349 [3086]	340
45 [12]			82 [723]	145 [1281]	209 [1853]	291 [2578]	315 [2786]	343 [3031]	408
53 [14]			74 [654]	129 [1143]	183 [1621]	238 [2103]	287 [2539]	349 [3085]	476
61 [16]				143 [1261]	199 [1763]	251 [2224]	301 [2666]	363 [3213]	544
68 [18]				120 [1059]	179 [1586]	233 [2058]	284 [2510]	347 [3071]	612
76 [20]				107 [944]	160 [1419]	217 [1918]	268 [2374]	327 [2896]	680
83 [22]				93 [824]	157 [1393]	206 [1823]	257 [2271]		748
91 [24]				86 [762]	139 [1234]	197 [1744]	250 [2214]		816
95 [25]				77 [678]	132 [1171]	191 [1694]	243 [2154]		850

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

31 [271]	61 [541]	122 [1083]	184 [1624]	245 [2166]	306 [2707]	367 [3248]	428 [3790]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



125

Pressure - bars [psi]						Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]

127 cc [7.7 in³/rev.]

Torque - Nm [lb-in], Speed rpm Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	14 [127]	44 [394]	109 [961]	159 [1408]	217 [1922]	267 [2364]	313 [2766]	355 [3146]	Theoretical rpm
	4 [1]	16 [138]	45 [401]	108 [952]	167 [1475]	226 [2004]	278 [2459]	332 [2936]	367 [3245]	
	8 [2]		49 [432]	108 [953]	165 [1462]	231 [2046]	286 [2528]	332 [2941]	387 [3421]	
	15 [4]		59 [519]	107 [949]	167 [1479]	229 [2024]	284 [2513]	342 [3023]	392 [3467]	
	23 [6]			102 [902]	166 [1473]	223 [1973]	279 [2473]	337 [2985]	393 [3477]	
	30 [8]			179 [158]	160 [1420]	222 [1968]	287 [2541]	337 [2987]	391 [3459]	
	38 [10]			239 [209]	160 [1420]	222 [1968]	287 [2541]	337 [2987]	391 [3459]	
	45 [12]			239 [209]	154 [1359]	217 [1919]	273 [2413]	332 [2940]	387 [3428]	
	53 [14]			299 [259]	147 [1304]	207 [1831]	267 [2361]	329 [2914]	406 [3590]	
	61 [16]			359 [309]	146 [1293]	204 [1801]	268 [2375]	332 [2935]	419 [3704]	
	68 [18]			419 [369]	168 [1484]	198 [1756]	258 [2287]	327 [2895]	386 [3419]	
	76 [20]			473 [413]	193 [1704]	214 [1894]	278 [2460]	360 [3188]	386 [3412]	
	83 [22]				205 [1815]	245 [2164]	290 [2567]	344 [3040]	408 [3606]	
	91 [24]				577 [507]	561 [491]	537 [467]	505 [445]	453 [393]	
	95 [25]				151 [1336]	201 [1781]	260 [2298]	320 [2832]		

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

35 [307]	69 [613]	139 [1226]	208 [1839]	277 [2452]	346 [3065]	416 [3678]	485 [4291]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

160

Pressure - bars [psi]						Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]

164 cc [10.0 in³/rev.]

Torque - Nm [lb-in], Speed rpm Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	2 [0.5]	24 [216]	61 [538]	143 [1267]	213 [1881]	287 [2536]	351 [3106]	411 [3640]	470 [4159]	Theoretical rpm
	4 [1]	28 [244]	67 [596]	145 [1287]	215 [1899]	291 [2578]	355 [3145]	425 [3758]	493 [4366]	
	8 [2]		66 [588]	148 [1306]	224 [1983]	301 [2666]	366 [3241]	441 [3904]	508 [4493]	
	15 [4]		46 [404]	146 [1291]	226 [2002]	313 [2769]	375 [3318]	451 [3990]	516 [4569]	
	23 [6]		92 [80]	146 [1295]	224 [1986]	307 [2718]	379 [3358]	449 [3975]	515 [4553]	
	30 [8]		137 [119]	142 [1258]	221 [1954]	299 [2644]	376 [3329]	447 [3952]	520 [4603]	
	38 [10]			184 [162]	216 [1909]	289 [2558]	371 [3282]	448 [3961]	520 [4598]	
	45 [12]			230 [200]	208 [1842]	284 [2510]	357 [3161]	436 [3862]	512 [4529]	
	53 [14]			277 [247]	202 [1788]	275 [2438]	353 [3124]	427 [3781]	509 [4508]	
	61 [16]			323 [283]	187 [1659]	275 [2431]	338 [2994]	418 [3698]	496 [4392]	
	68 [18]			369 [329]	175 [1553]	257 [2278]	325 [2874]	405 [3587]	480 [4246]	
	76 [20]			415 [365]	169 [1499]	246 [2176]	328 [2906]	397 [3514]	477 [4223]	
	83 [22]			461 [411]	147 [1297]	232 [2049]	315 [2792]	385 [3411]		
	91 [24]			507 [457]	131 [1157]	218 [1928]	300 [2655]	378 [3344]		
	95 [25]			553 [503]	121 [1073]	208 [1844]	291 [2577]	365 [3229]		

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

45 [398]	90 [796]	180 [1592]	270 [2389]	360 [3185]	450 [3981]	540 [4777]	630 [5573]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



200

Pressure - bars [psi]							Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]	

205 cc [12.5 in³/rev.]

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm								Theoretical rpm
	35 [314]	83 [734]	179 [1581]	267 [2365]	353 [3121]	443 [3921]	505 [4469]	579 [5120]	
2 [0.5]	9	9	8	7	6	5	4	3	10
4 [1]	18	18	17	14	13	11	9	8	19
8 [2]	36	36	35	31	27	24	21	20	37
15 [4]	73	73	72	68	61	53	49	46	74
23 [6]	110	109	106	98	89	81	74	74	111
30 [8]		147	144	136	123	112	104	104	148
38 [10]		184	182	173	162	151	141	141	185
45 [12]		221	219	214	200	187	176	176	222
53 [14]		258	256	250	238	224	213	213	259
61 [16]		295	290	286	277	264	242	242	296
68 [18]		331	327	323	319	303	289	289	333
76 [20]			369	365	360	343	331	331	370
83 [22]			405	401	395	382			407
91 [24]			442	441	438	425			444
95 [25]			460	458	456	444			462

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

56 [498]	112 [995]	225 [1990]	337 [2986]	450 [3981]	562 [4976]	675 [5971]	787 [6967]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

250

Pressure - bars [psi]							Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]	

254 cc [15.5 in³/rev.]

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm								Theoretical rpm
	43 [381]	104 [924]	221 [1955]	339 [3001]	449 [3974]	551 [4872]			
2 [0.5]	7	6	6	5	3	1			8
4 [1]	14	14	13	11	9	7	668 [5907]	4	15
8 [2]	29	29	28	26	22	17	712 [6303]	13	30
15 [4]	59	58	57	56	51	41	741 [6555]	33	60
23 [6]	89	88	88	87	82	69	747 [6611]	58	90
30 [8]	119	118	118	117	115	101	744 [6587]	87	120
38 [10]	149	148	147	141	129	114	717 [6345]	114	150
45 [12]			178	176	174	165	703 [6225]	147	179
53 [14]			208	206	205	197	711 [6296]	176	209
61 [16]			238	235	233	227	674 [5960]	205	239
68 [18]			268	266	263	259	661 [5846]	245	269
76 [20]			298	295	292	289	627 [5547]	277	299
83 [22]			326	323	319	307	607 [5368]		328
91 [24]			357	355	353	342			358
95 [25]			371	368	365	360			373

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

70 [617]	139 [1234]	279 [2468]	418 [3702]	558 [4936]	697 [6170]	837 [7404]	976 [8639]
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Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



300

Pressure - bars [psi]						Max. Cont.	Max. Inter.
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	242 [3500]

293 cc [17.9 in³/rev.]

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm							Theoretical rpm
	61 [543] 6	118 [1044] 5	261 [2311] 5	388 [3433] 4				
2 [0.5]	59 [521] 12	140 [1237] 12	271 [2397] 11	414 [3666] 11	546 [4833] 8	681 [6025] 5		7
4 [1]	61 [541] 25	128 [1134] 25	281 [2490] 24	425 [3761] 23	562 [4970] 19	693 [6128] 14	820 [7259] 10	13
8 [2]	52 [461] 51	128 [1130] 51	275 [2436] 50	427 [3782] 50	578 [5119] 44	715 [6327] 32	827 [7317] 25	26
15 [4]		115 [1017] 77	266 [2351] 76	406 [3592] 75	557 [4931] 70	706 [6250] 55	840 [7435] 43	52
23 [6]		107 [951] 103	251 [2223] 102	407 [3598] 101	538 [4759] 96	691 [6117] 82	832 [7359] 66	78
30 [8]		88 [779] 129	229 [2026] 127	393 [3475] 126	528 [4672] 122	672 [5950] 109	826 [7307] 90	104
38 [10]			217 [1923] 154	368 [3256] 153	504 [4457] 150	663 [5864] 133	800 [7076] 112	130
45 [12]			201 [1782] 180	347 [3067] 178	510 [4513] 173	646 [5713] 161	798 [7060] 140	155
53 [14]			168 [1491] 206	324 [2865] 204	472 [4180] 201	621 [5492] 188	764 [6765] 171	181
61 [16]			143 [1266] 232	298 [2638] 230	427 [3783] 227	591 [5234] 220	745 [6591] 198	207
68 [18]			114 [1013] 258	283 [2501] 256	443 [3916] 254	597 [5284] 247	717 [6344] 227	233
76 [20]				246 [2179] 282	397 [3512] 280	559 [4943] 274	681 [6023] 257	259
83 [22]				181 [1601] 309	357 [3159] 306	502 [4442] 304	642 [5684] 294	284
91 [24]				166 [1466] 321	323 [2858] 319	491 [4347] 318	630 [5577] 300	310
95 [25]								323

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

81 [713]	161 [1425]	322 [2850]	483 [4275]	644 [5701]	805 [7126]	966 [8551]	1127 [9976]
----------	------------	------------	------------	------------	------------	------------	-------------

Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]

400

Pressure - bars [psi]						Max. Cont.	Peak
17 [250]	35 [500]	69 [1000]	104 [1500]	138 [2000]	173 [2500]	207 [3000]	

409 cc [24.9 in³/rev.]

Intermittent Ratings - 10% of Operation

Flow - lpm [gpm]	Torque - Nm [lb-in], Speed rpm							Theoretical rpm
	85 [757] 4	193 [1710] 4	367 [3248] 3	534 [4721] 2				
2 [0.5]	88 [776] 9	185 [1640] 8	383 [3386] 8	580 [5129] 6	745 [6590] 4	899 [7954] 1		5
4 [1]	86 [762] 18	196 [1734] 18	394 [3487] 17	586 [5184] 15	764 [6763] 11	927 [8204] 5		10
8 [2]	85 [749] 37	188 [1661] 36	404 [3571] 35	602 [5325] 32	796 [7047] 24	962 [8517] 18	1108 [9804] 9	19
15 [4]	71 [629] 55	180 [1593] 55	387 [3428] 54	596 [5274] 49	787 [6969] 39	978 [8653] 28	1141 [10094] 20	38
23 [6]		165 [1462] 74	373 [3299] 73	595 [5264] 69	792 [7010] 58	966 [8552] 44	1149 [10167] 31	56
30 [8]		143 [1269] 92	356 [3150] 90	581 [5144] 88	782 [6923] 79	974 [8617] 62	1156 [10231] 45	75
38 [10]		122 [1076] 111	333 [2950] 109	545 [4823] 107	749 [6624] 98	957 [8470] 83	1143 [10116] 61	93
45 [12]		95 [842] 129	313 [2774] 128	521 [4607] 126	717 [6344] 117	931 [8235] 103	1131 [10007] 78	112
53 [14]			282 [2493] 147	496 [4385] 145	685 [6063] 141	919 [8131] 121	1100 [9733] 100	130
61 [16]			244 [2156] 166	453 [4009] 165	681 [6023] 158	871 [7708] 142	1071 [9478] 121	149
68 [18]			197 [1741] 185	420 [3713] 183	650 [5756] 179	838 [7417] 166	1051 [9302] 145	167
76 [20]			164 [1448] 203	378 [3344] 201	588 [5200] 198	810 [7171] 186		186
83 [22]				333 [2947] 222	559 [4945] 220	750 [6640] 211		205
91 [24]				303 [2682] 231	539 [4773] 228	764 [6760] 221		223
95 [25]								232

Overall Efficiency - 70 - 100% 40 - 69% 0 - 39%

Theoretical Torque - Nm [lb-in]

112 [991]	224 [1982]	448 [3965]	672 [5947]	896 [7930]	1120 [9912]	1344 [11895]
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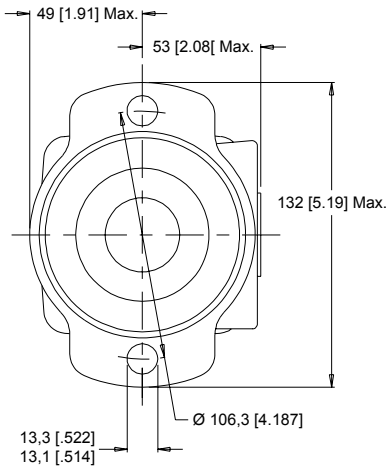
Displacement tested at 54°C [129°F] with an oil viscosity of 46cSt [213 SUS]



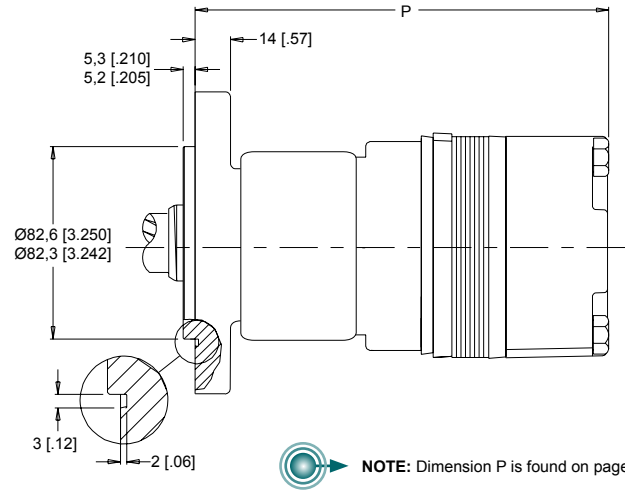
NOTE: Dimensions shown are without paint. Paint thickness can be up to 0,13 [.005]

300 SERIES HOUSINGS (MAGNETO MOUNTS)

A0 2-Hole with End Ports

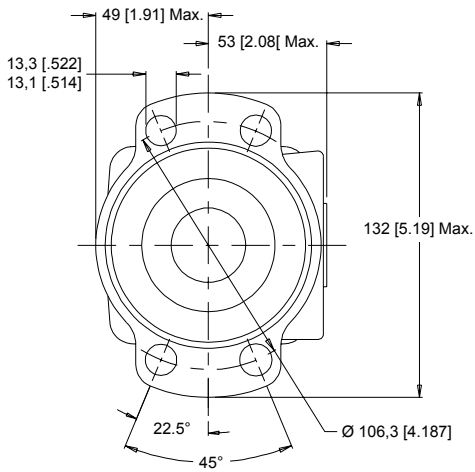


A7 2-Hole with Side Ports

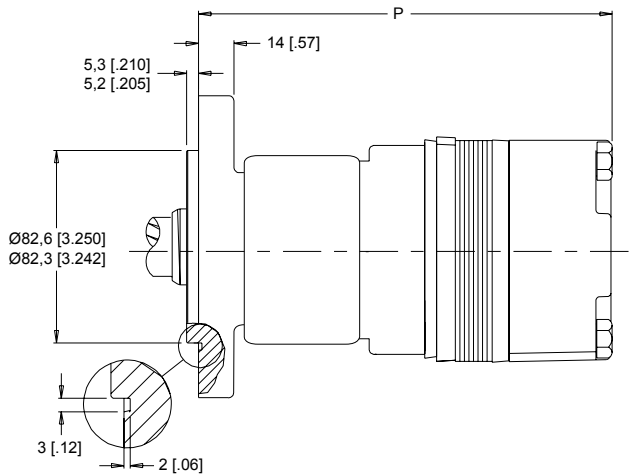


NOTE: Dimension P is found on page 10.

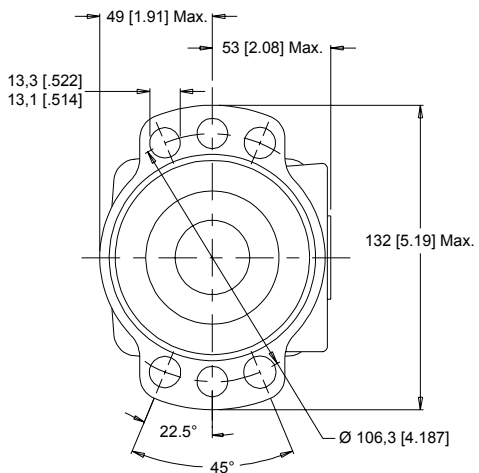
A2 4-Hole with End Ports



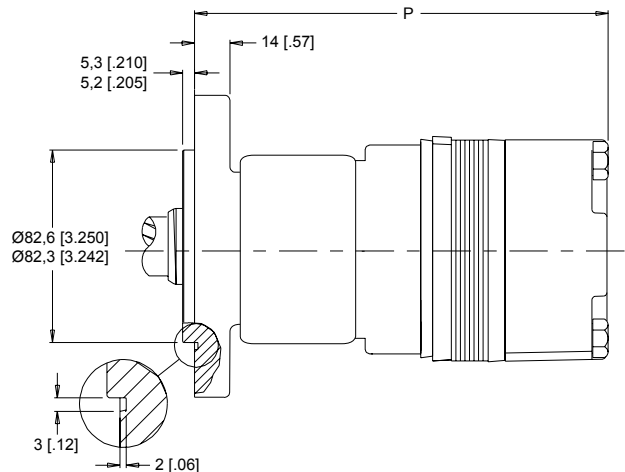
A8 4-Hole with Side Ports



A4 6-Hole with End Ports



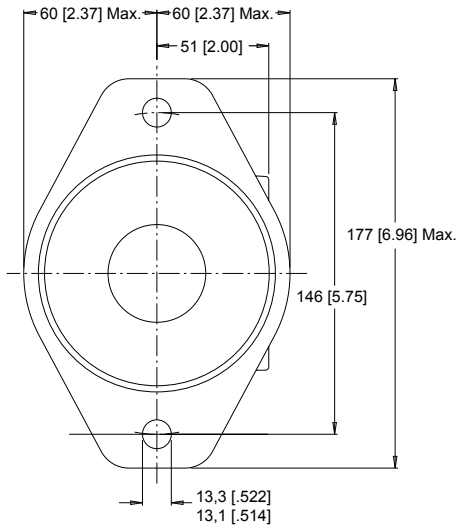
A9 6-Hole with Side Ports



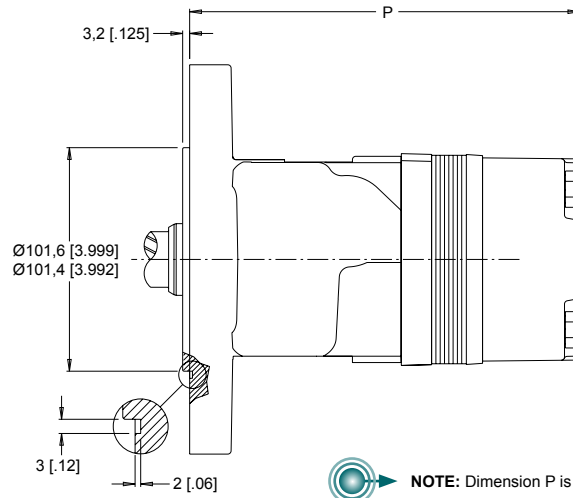


300 SERIES HOUSINGS (SAE B, WHEEL, & 4-HOLE SQUARE MOUNTS)

B0 2-Hole with End Ports

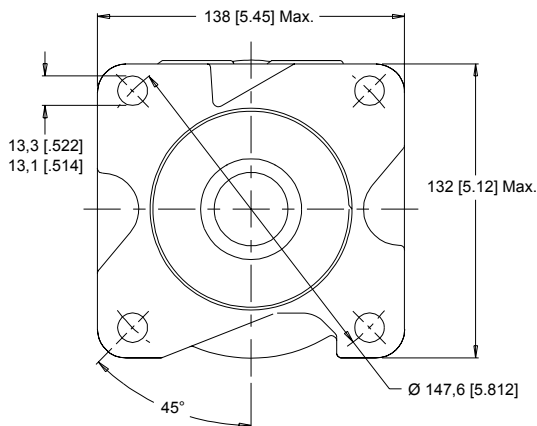


B7 2-Hole with Side Ports

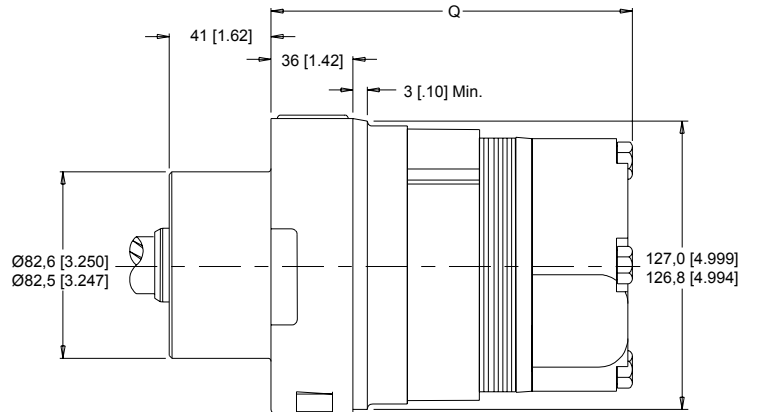


NOTE: Dimension P is found on page 10.

W2 4-Hole with End Ports

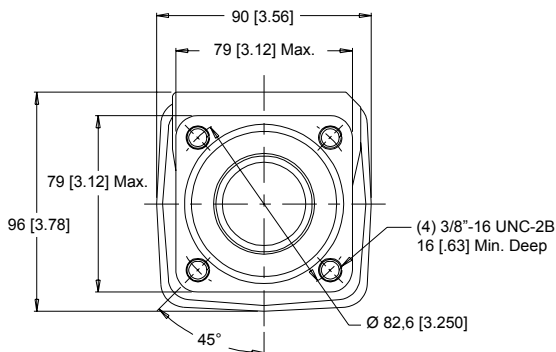


W8 4-Hole with Side Ports

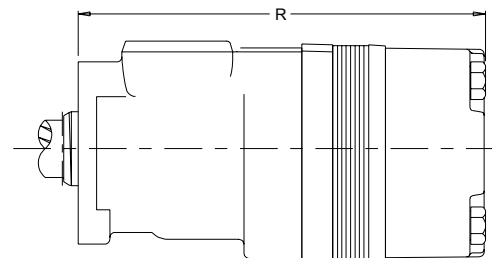


NOTE: Dimension Q is found on page 10.

F2 4-Hole with End Ports



F8 4-Hole with Side Ports



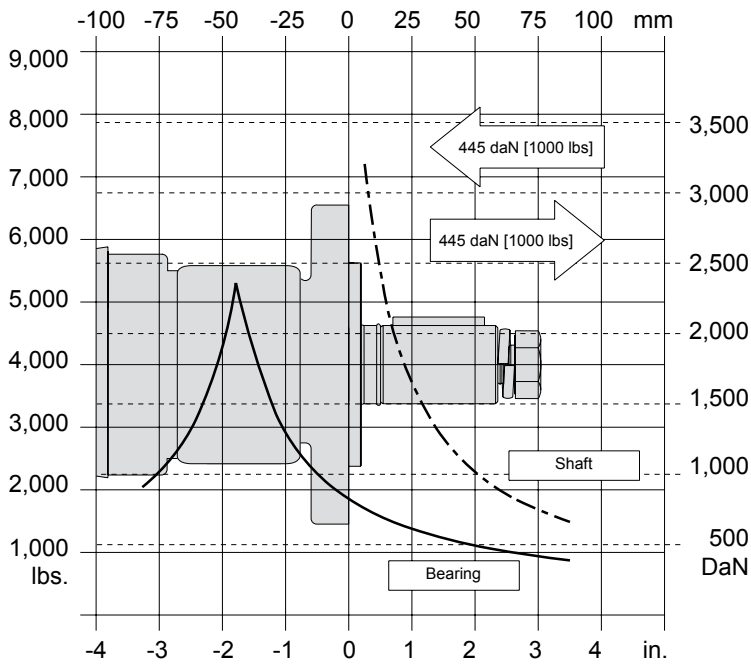
NOTE: Dimension R is found on page 11.



300 SERIES TECHNICAL INFORMATION

Bearing Curve: The bearing curve represents allowable bearing loads based on ISO 281 bearing capacity for an L_{10} life of 2,000 hours at 100 rpm. Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor table located below.

SAE A & B MOUNTS



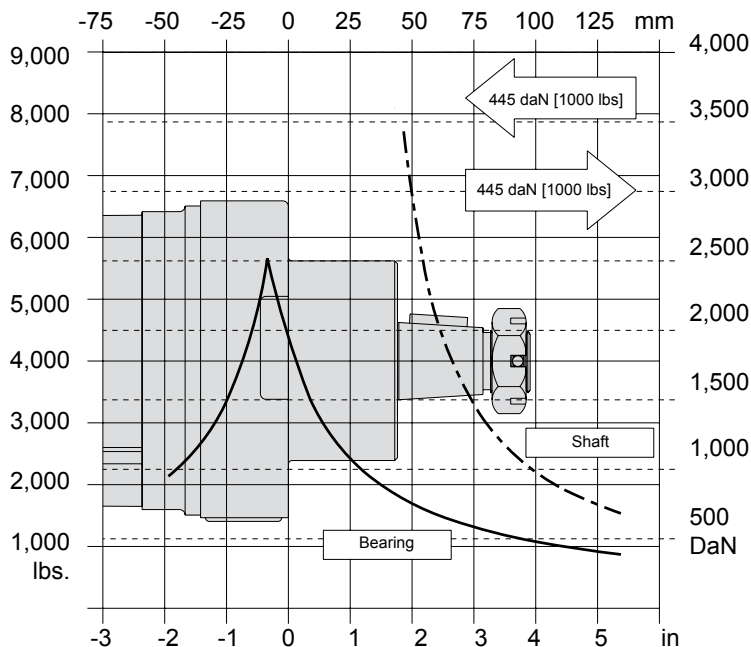
LENGTH / WEIGHT CHART SAE A & B Mounts - Dimension P		
Code	mm [in]	kg [lb]
050	195 [7.68]	8,8 [19.5]
080	199 [7.82]	9,1 [20.0]
090	201 [7.90]	9,2 [20.2]
110	204 [8.04]	9,4 [20.7]
125	207 [8.14]	9,5 [21.0]
160	212 [8.36]	9,8 [21.7]
200	219 [8.61]	10,2 [22.5]
250	226 [8.91]	10,6 [23.4]
300	232 [9.15]	11,0 [24.3]
400	251 [9.86]	12,0 [26.4]

NOTE:
HB motor weights vary ± 1.0 kg [2 lbs] depending upon motor configuration. Add 1,2 kg [2.7 lb] to motor weight for the SAE B mount. Subtract 18 [7.1] from Dimension P if side ports 5, 6, or 7 and end ports 1 or 2 are used.

LENGTH / WEIGHT CHART Wheel Mount - Dimension Q		
Code	mm [in]	kg [lb]
050	158 [6.22]	11,5 [25.3]
080	162 [6.36]	11,7 [25.7]
090	163 [6.41]	11,8 [25.9]
110	166 [6.55]	12,0 [26.5]
125	169 [6.64]	12,1 [26.7]
160	174 [6.87]	12,4 [27.4]
200	181 [7.12]	12,8 [28.3]
250	188 [7.42]	13,2 [29.7]
300	195 [7.66]	13,6 [30.0]
400	213 [8.37]	14,6 [32.1]

NOTE:
HB motor weights vary ± 1.0 kg [2 lbs] depending upon motor configuration. Subtract 18 [7.1] from Dimension Q if side ports 5, 6, or 7 and end ports 1 or 2 are used.

WHEEL MOUNT



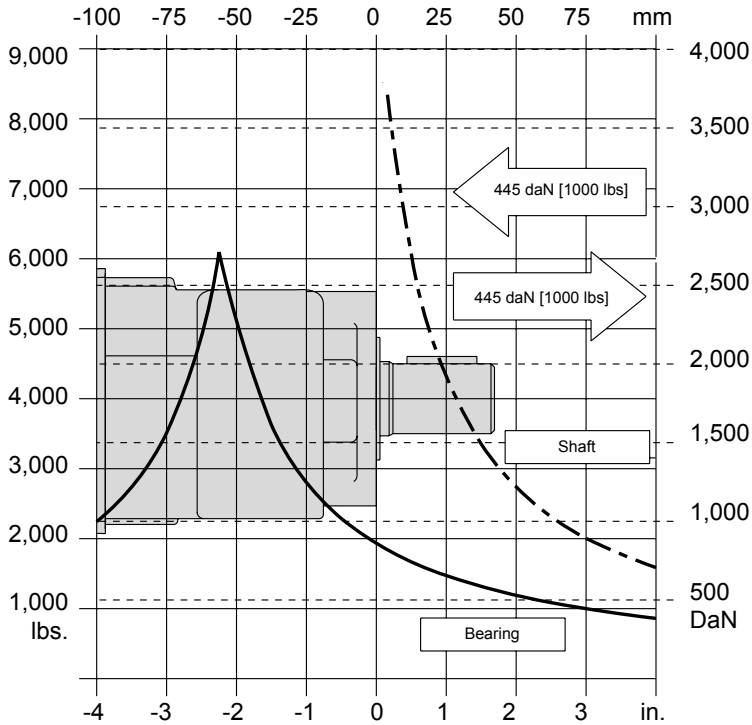
BEARING LOAD MULTIPLICATION FACTOR TABLE	
RPM	FACTOR
50	1.23
100	1.00
200	0.81
300	0.72
400	0.66
500	0.62
600	0.58
700	0.56
800	0.50



300 SERIES TECHNICAL INFORMATION

Bearing Curve: The bearing curve represents allowable bearing loads based on ISO 281 bearing capacity for an L_{10} life of 2,000 hours at 100 rpm. Radial loads for speeds other than 100 rpm may be calculated using the multiplication factor table located on page 10.

4-HOLE SQUARE MOUNT



LENGTH / WEIGHT CHART 4-Hole Sq. Mount - Dimension R

Code	mm [in]	kg [lb]
050	198 [7.80]	8,3 [18.4]
080	202 [7.94]	8,6 [18.9]
090	204 [8.02]	8,7 [19.1]
110	207 [8.16]	8,9 [19.6]
125	210 [8.26]	9,0 [19.9]
160	215 [8.48]	9,3 [20.6]
200	222 [8.73]	9,7 [21.4]
250	229 [9.03]	10,1 [22.3]
300	236 [9.27]	10,5 [23.2]
400	254 [9.98]	11,5 [25.3]

NOTE:
HB motor weights vary ± 1.0 kg [2 lbs] depending upon motor configuration. Subtract 18 [7.1] from Dimension R if side ports 5, 6, or 7 and end ports 1 or 2 are used.

MOUNTING FLANGE TO SHAFT END - Dimension S

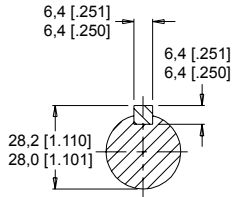
Code	SAE A & B Mounts mm [in]	Wheel Mounts mm [in]	4-Hole Sq. Mounts mm [in]
01	44 [1.75]	82 [3.21]	41 [1.63]
02	49 [1.93]	86 [3.39]	46 [1.81]
07	62 [2.46]	100 [3.93]	60 [2.35]
08	62 [2.46]	100 [3.93]	60 [2.35]
10	49 [1.93]	86 [3.39]	46 [1.81]
12	55 [2.17]	92 [3.63]	52 [2.05]
15	51 [1.99]	88 [3.45]	47 [1.87]
20	61 [2.40]	99 [3.87]	58 [2.29]
21	61 [2.40]	98 [3.87]	58 [2.29]
22	66 [2.58]	103 [4.04]	63 [2.46]
23	57 [2.23]	94 [3.69]	54 [2.11]

NOTE: Shaft lengths vary $\pm 0,8$ mm [.030 in.]

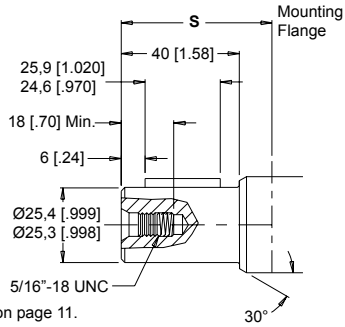


10 1" Straight

Max. Torque: 661 Nm [5850 lb-in]

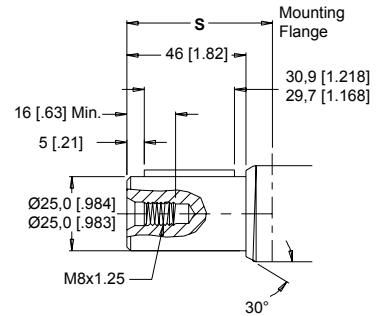
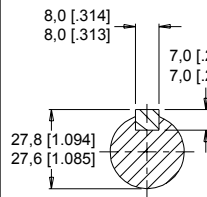


*15 1" Straight Extended



12 25mm Straight

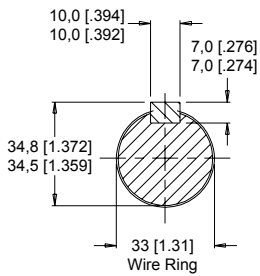
Max. Torque: 631 Nm [5580 lb-in]



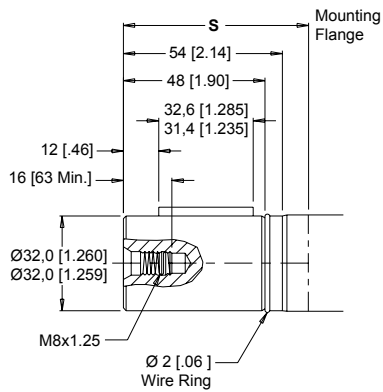
NOTE: Dimension S is found on page 11.

21 32mm Straight

Max. Torque: 882 Nm [7804 lb-in]

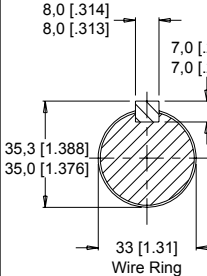


*08 32mm Straight Extended

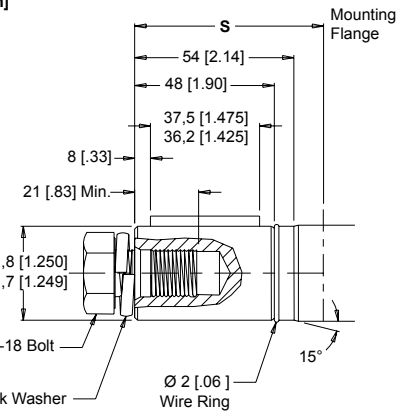


20 1-1/4" Straight

Max. Torque: 882 Nm [7804 lb-in]

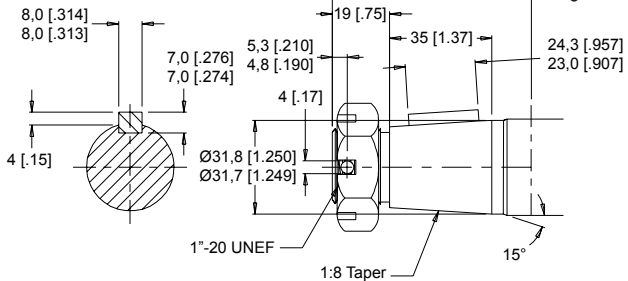


*07 1-1/4" Straight Extended



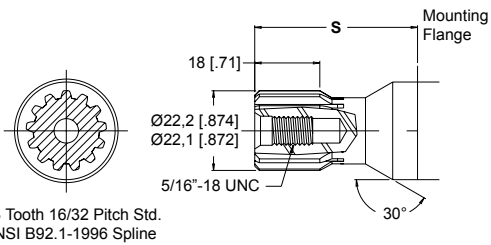
22 1-1/4" Tapered

Max. Torque: 882 Nm [7804 lb-in]



01 13 Tooth Spline

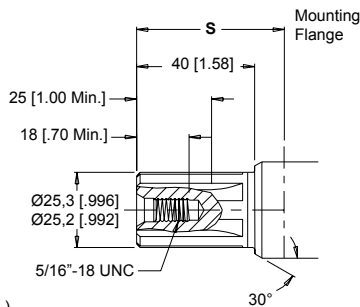
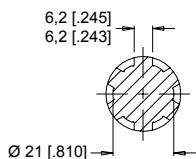
Max. Torque: 170 Nm [1500 lb-in]



NOTE: A slotted nut is standard on this shaft.

02 6-B Spline

Max. Torque: 429 Nm [3800 lb-in]

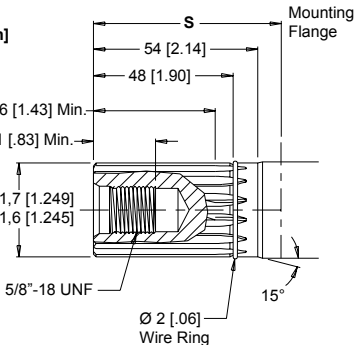
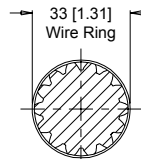


1.00-6-B Spline (SAE J499 Std.)

NOTE: *Shafts for speed sensor use only.

23 14 Tooth Spline

Max. Torque: 882 Nm [7804 lb-in]

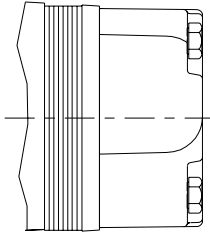


14 Tooth 12/24 pitch Std. ANSI B92.1-1996 Spline

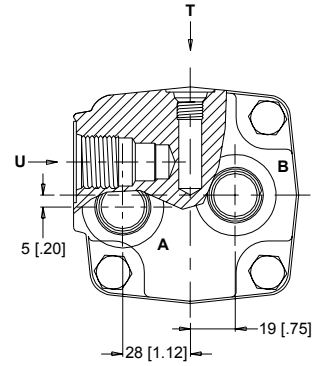
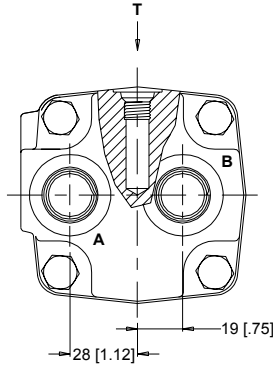


END PORTS

1 7/8" O-Ring with 7/16" Drain



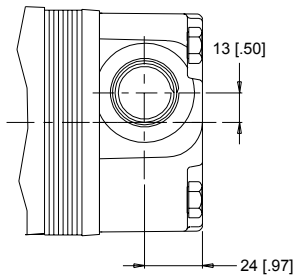
2 1/2" BSP.F with 1/4" Drain



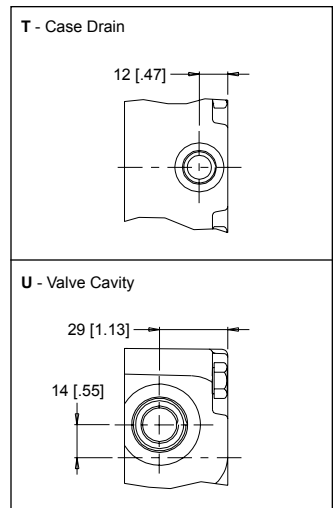
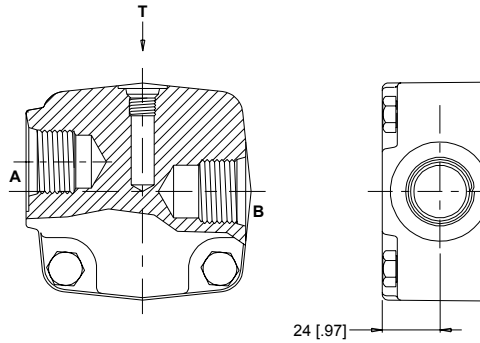
NOTE: The 1 & 2 porting options can be ordered with an internal drain and/or a relief valve cavity. U - 10 Series/2-way Valve Cavity (7/8-14 UNF-2B)

SIDE PORTS

6 1-1/16" O-Ring with 7/16" Drain

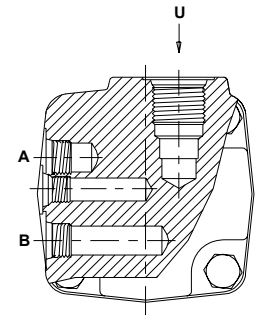
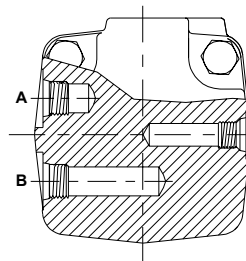
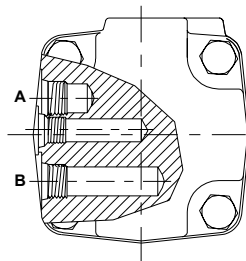
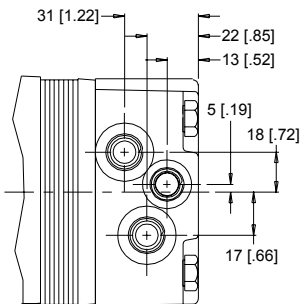


7 1/2" BSP.F with 1/4" Drain



NOTE: The 6 & 7 porting options can be ordered with an internal drain.

5 9/16" O-Ring with 7/16" Drain



NOTE: The 5 porting option can be ordered with an internal drain or a relief valve cavity. U - 10 Series/2-way Valve Cavity (7/8-14 UNF-2B)

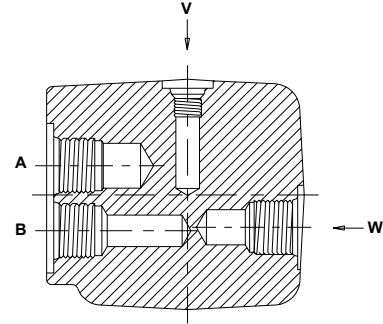
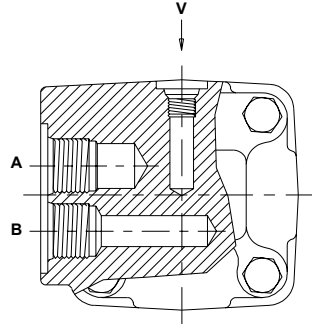
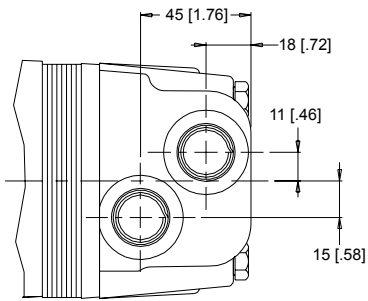
HB

300 SERIES PORTING OPTIONS

SIDE PORTS

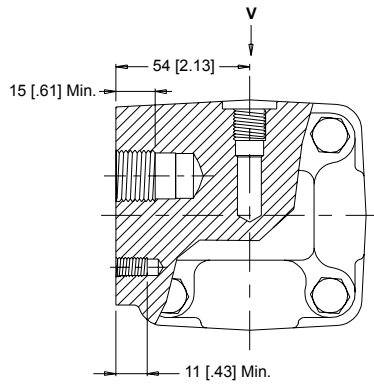
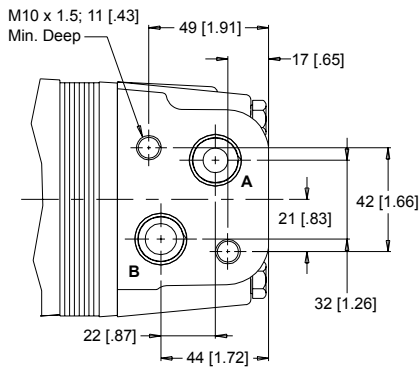
1 7/8" O-Ring with 7/16" Drain

2 1/2" BSP.F with 1/4" Drain

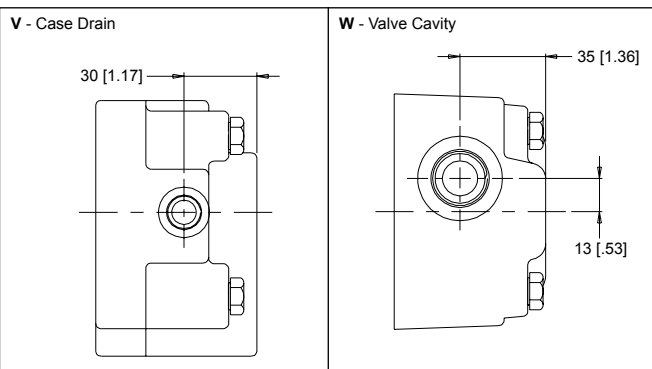


NOTE: The 1 & 2 porting options can be ordered with an internal drain and/or a relief valve cavity. **W** - 10 Series/2-way Valve Cavity (7/8-14 UNF-2B)

3 1/2" BSP.F Offset Manifold With 1/4" Drain



NOTE: The 3 porting option can be ordered with an internal drain.





300 SERIES MODEL CODE BUILDER

SERIES	DISPLACEMENT	HOUSING	SHAFT	PAINT	CAVITY	ADD ON	MISCELLANEOUS
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7	STEP 8

STEP 1 - Select a series

300 High Pressure HB Series

STEP 2 - Select a displacement option

050	52 cc	[3.2 in ³ /rev]	160	164 cc	[10.0 in ³ /rev]
080	76 cc	[4.6 in ³ /rev]	200	205 cc	[12.5 in ³ /rev]
090	89 cc	[5.4 in ³ /rev]	250	254 cc	[15.5 in ³ /rev]
110	111 cc	[6.8 in ³ /rev]	300	293 cc	[17.9 in ³ /rev]
125	127 cc	[7.7 in ³ /rev]	400	409 cc	[24.9 in ³ /rev]

STEP 3 - Select a mounting option

NOTE: To complete the three (3) digit HB Series housing code a two (2) digit mounting option must be followed with the single (1) digit porting option found in STEP 3 part II. Side port mounting options need side port porting options and end port mounting options need end port porting options.

A0	2-Hole End Port Magneto Mount (S)
A7	2-Hole Side Port Magneto Mount (S)
A2	4-Hole End Port Magneto Mount (S)
A8	4-Hole Side Port Magneto Mount (S)
A4	6-Hole End Port Magneto Mount (S)
A9	6-Hole Side Port Magneto Mount (S)
B0	2-Hole End Port SAE B Mount
B7	2-Hole Side Port SAE B Mount
W2	4-Hole End Port Wheel Mount
W8	4-Hole Side Port Wheel Mount
F2	4-Hole End Port Square Mount (S)
F8	4-Hole Side Port Square Mount (S)

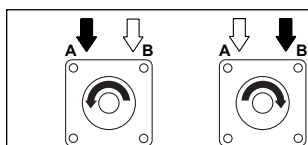
STEP 3 (part II) - Select a porting option

END PORTS

1	7/8" O-Ring With 7/16" Drain
2	1/2" BSP.F With 1/4" Drain

SIDE PORTS

1	7/8" O-Ring With 7/16" Drain
2	1/2" BSP.F With 1/4" Drain
3	1/2" BSP.F Offset Manifold With 1/4" Drain
5	9/16" O-Ring With 7/16" Drain
6	1-1/16" O-Ring With 7/16" Drain
7	1/2" BSP.F With 1/4" Drain



NOTE: HB Series motors do not have internal components that allow the motor to turn in either direction. Refer to the diagram to the left to determine which way the motor will turn when either port A or port B is pressurized.

STEP 4 - Select a shaft option

01	7/8" 13 Tooth Spline	15	1" Straight Ext. (S)
02	1" 6-B Spline	20	1-1/4" Straight
07	1-1/4" Straight Ext. (S)	21	32mm Straight
08	32mm Straight Ext. (S)	22	1-1/4" Tapered
10	1" Straight	23	1-1/4" 14 Tooth Spline
12	25mm Straight		

STEP 5 - Select a paint option

A	Black
B	Black (unpainted flange face)
Z	No Paint

STEP 6 - Select a valve cavity option

A	None
B	Relief Valve Cavity
C	69 bar [1000 psi] Relief Valve Installed
D	86 bar [1250 psi] Relief Valve Installed
E	104 bar [1500 psi] Relief Valve Installed
F	121 bar [1750 psi] Relief Valve Installed
G	138 bar [2000 psi] Relief Valve Installed
J	173 bar [2500 psi] Relief Valve Installed
L	207 bar [3000 psi] Relief Valve Installed

NOTE: Valve cavity option is only available on side ports 1, 2, & 5 and end ports 1 & 2.

STEP 7 - Select an add on option

A	Standard
B	Lock Nut
C	Solid Hex Nut
W	4-Pin Dual Male Weatherpack Connector (S)
X	4-Pin M12 Dual Male Connector (S)
Y	3-Pin Single Male Weatherpack Connector (S)
Z	4-Pin M12 Single Male Connector (S)

NOTE: (S) - STEP 3 Mountings available for use with speed sensors. STEP 4 Shafts available for use with speed sensors. STEP 7 Speed sensor options.

STEP 8 - Select a miscellaneous option

AA	None
AB	Internal Drain
AC	Freeturning Rotor
AD	Internal Drain with Freeturning Rotor